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ATOMIC ENERGY OF CANADA LIMITED

CHALK RIVER PROJECT — CHALK RIVER, ONT.

December 8, 1954

Dear Josh, (NEWCOMBE)

Howard has just shown me your very interesting letter. I was especially pleased to read that J. G. Bradley is working with some auxotrophs of an actinomycete in the hope of turning up some sort of recombination. As Howard has no doubt written you, it seemed to be of considerable interest to himself and to myself if the Streptomyces work could be put on a firmer genetic basis.

Last summer, in a few odd moments, I dabbled with a pair of UV induced mutants of strain T12 (a methionine requirer and an unknown yeast E - (casamino requirer) with the object of a genetic test for recombination. Like yourselves, I found a suggestion of the formation of heterokaryons, which however segregated completely in sporogenesis. I did some typical tyf isolates and again found only one type or the other. The number of successful isolates was small (38) due to very low viability. Incidentally I found it best to grow the colony on a small cellophane square on the surface of the agar — thus making a nice flat surface easily transferred to a slide for dissection with the de Fonbrune. I had reached the point of trying to observe the germination of single spores of both types — and isolate the growing tip as soon as possible thereafter. I never

observed the type of mycelial fusion you see in Neurospora. If there is a hetero karyon formed in vitro, I suspect it is formed shortly after germination, is very short-lived, and that no more fusions occur in the older mycelium. I haven't gotten further on this problem, I became engrossed in another aspect of Streptomyces behavior. I don't believe I shall be able to get back to it soon and I'd very much like to see it done. If you are interested in using our strain, please write, I'd be very happy to send it on. You may find the numerous color variants useful. Also useful might be the information that post-UV treatment of Strep spores with iodoacetate for 3 hours increases the frequency of induced mutants (Stan's work).

I think I'm beginning to see an end in sight for my thesis problem - I'm hoping to start writing this month. Also I have found that as a consequence of storing spores of Streptomyces at 4°C for varying periods of time, an increased frequency of mutant colonies result from growth of these spores. The increases under certain conditions are from 10% to 25%. These are new mutational events — not due to selection, there's no nuclear division during storage — it's not temp shock or extra background radiation. I still can't distinguish between the possibilities that these mutations are occurring during storage or whether there is an increased prob. that the spores will mutate following storage.

Just as soon as the U S comes through with a visa for Stan, we'll be on our way to Yale. Bonner has invited Stan to work with him.

I hope we'll get a chance to see you both when we're in the States.

Best regards, especially to Esther

Lil.